

CLAIMS

The following listing of claims replaces all prior versions and listings of claims in the Application.

1. (currently amended) A method of stabilising a thermally beneficiated carbonaceous material which comprises:

- (a) supplying a charge of the carbonaceous material at an elevated temperature resulting from thermal beneficiation to a process vessel to form a packed bed;
- (b) cooling the carbonaceous material in the packed bed from the elevated temperature to a target temperature less than the elevated temperature by indirect heat exchange;
- (c) before the carbonaceous material reaches the target temperature, supplying an oxygen-containing gas to the packed bed to partially oxidise the carbonaceous material to a required degree to stabilise the carbonaceous material; and
- (d) removing heat from the packed bed during partial oxidation that is produced by oxidation of carbonaceous material to [control] maintain the temperature of the carbonaceous material substantially constant during oxidation to avoid thermal runaway.

2. (original) The method defined in claim 1 wherein the required degree of oxidation in step (c), measured as the weight of oxygen supplied to the packed bed as a percentage of the total weight of the coal in the packed bed, is in the range of 0.2 to 5wt%.

3. (original) The method defined in claim 2 wherein the target temperature is less than 50°C.

4. (original) The method defined in claim 2 wherein the required degree of oxidation is in the range of 0.5 to 3wt%.

5. (original) The method defined in claim 4 wherein the target temperature is less than 35°C.

6. (previously presented) The method defined in claim 1 further comprising removing heat from the packed bed in step (d) by means of circulating a working fluid through the packed bed and a coolant circuit which includes heat transfer surfaces in the packed bed.

7. (original) The method defined in claim 6 wherein the working fluid is a gas.

8. (original) The method defined in claim 7 wherein step (b) comprises a first stage of cooling the carbonaceous material from the elevated temperature to a preferred oxidation temperature of the carbonaceous material without supplying oxygen-containing gas to the packed bed during this initial cooling stage.

9. (original) The method defined in claim 8 wherein step (c) comprises supplying the oxygen-containing gas to the packed bed to partially oxidise the carbonaceous material when the carbonaceous material reaches the preferred oxidation temperature.

10. (original) The method defined in claim 9 wherein, after partial oxidation step (c) is completed, step (b) comprises a second stage of cooling the carbonaceous material to the target temperature.

11. (previously presented) The method defined in claim 6 further comprising controlling the temperature of the heat transfer surfaces relative to a preferred oxidation temperature to maintain a small gradient across the bed.

12. (original) The method defined in claim 11 wherein the temperature difference is less than 40°C.

13. (previously presented) The method defined in claim 6 further comprising controlling the temperature of the working fluid to be greater than the wall temperature of the internal heat transfer surfaces and less than that of the carbonaceous material.

14. (original) The method defined in claim 8 wherein the preferred oxidation temperature is in the range of 80 - 150°C.

15. (original) The method defined in claim 14 wherein the preferred oxidation temperature is in the range of 100 - 150°C.

16. (original) The method defined in claim 14 wherein the preferred oxidation temperature is in the range of 100 - 120°C.

17. (previously presented) The method defined in claim 1 further comprising pressurising the packed bed with an externally supplied gas to a pressure of less than 20 bar.

18. (previously presented) The method defined in claim 11 further comprising controlling the temperature of the working fluid to be greater than a wall temperature of the internal heat transfer surfaces and less than that of the carbonaceous material.

19. (previously presented) The method defined in claim 12 further comprising controlling the temperature of the working fluid to be greater than a wall temperature of the internal heat transfer surfaces and less than that of the carbonaceous material.